

WHAT IS CLAIMED IS:

1. A touch screen display, comprising:
 - a) an electroluminescent display;
 - b) a touch screen , and
 - c) a transparent sheet that functions as an element of both the electroluminescent display and the touch screen.
2. The display of claim 1, wherein the electroluminescent display is a bottom emitting organic light emitting diode display (OLED) and the transparent sheet functions as a substrate for both the OLED display and the touch screen.
3. The display of claim 1, wherein the electroluminescent display is a top emitting organic light emitting diode display (OLED) and the transparent sheet functions as a cover sheet for the OLED display and a substrate for the touch screen.
4. The display of claim 1, wherein the touch screen is a resistive touch screen.
5. The display of claim 1, wherein the touch screen is a capacitive touch screen.
6. The display of claim 1, wherein the touch screen is a surface acoustic wave touch screen.
7. The display of claim 1, wherein the transparent sheet is glass.
8. The display of claim 1, wherein the transparent sheet is plastic.

FIGURE 10 - FIGURE 60

9. A method of manufacturing a touch screen display, comprising the steps of:

- a) providing a transparent sheet having two faces;
- b) disposing an electroluminescent display on one face of the transparent sheet; and
- c) disposing a touch screen on the other face of the transparent sheet.

10. The method of claim 9, wherein the electroluminescent display is a bottom emitting organic light emitting diode display (OLED) and the transparent sheet functions as a substrate for both the OLED display and the touch screen.

11. The display of claim 9, wherein the electroluminescent display is a top emitting organic light emitting diode display (OLED) and the transparent sheet functions as a cover sheet for the OLED display and a substrate for the touch screen.

12. The display of claim 9, wherein the touch screen is a resistive touch screen.

13. The display of claim 9, wherein the touch screen is a capacitive touch screen.

14. The display of claim 9, wherein the touch screen is a surface acoustic wave touch screen.

15. The display of claim 9, wherein the transparent sheet is glass.

16. The display of claim 9, wherein the transparent sheet is plastic.

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17. A method of manufacturing a touch screen display, comprising the steps of:

- a) providing a transparent sheet having two opposite faces;
- b) forming conductive layers on opposite faces of the transparent sheet;
- c) patterning the respective conductive layers to form a lower circuit layer for resistive touch sensitive elements and metal interconnections for light emitting elements on opposite sides of the transparent sheet;
- d) forming a hole injection layer over the metal interconnections;
- e) depositing organic light emitters on the hole injection layer;
- f) depositing an electron transport layer on the organic light emitters;
- g) depositing a metal cathode layer on the electron transport layer;
- h) placing a flexible spacer layer having a matrix of spacer dots onto the lower circuit layer;
- i) attaching a flexible upper circuit layer over the spacer layer; and
- j) laminating a flexible top protective layer onto the upper circuit layer.

18. A method of manufacturing a touch screen display, comprising the steps of:

- a) providing a transparent sheet having two opposite faces;
- b) forming a pattern of transparent metal oxide on one of the faces of the transparent sheet for a capacitive sensing touch screen, the pattern having corners;
- c) forming metal interconnections on the opposite face of the transparent sheet;
- d) patterning the metal interconnections for light emitting elements;
- e) forming a hole injection layer over the metal interconnections;
- f) depositing organic light emitters on the hole injection layer;
- g) depositing an electron transport layer on the organic light emitters;

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h) depositing a metal cathode layer on the electron transport layer; and
i) placing metal contacts on the corners of the transparent metal oxide
layer.

19. A method of manufacturing a touch screen display, comprising the
steps of:

- a) providing a transparent sheet having opposite faces;
- b) etching a pattern of surface acoustic wave reflectors into one face of
the transparent sheet;
- c) forming a conductive layer on the opposite face of the transparent
sheet;
- d) patterning the conductive layer to form metal interconnections for
light emitting elements;
- e) forming a hole injection layer over the metal interconnections;
- f) depositing organic light emitters on the hole injection layer;
- g) depositing an electron transport layer on the organic light emitters;
- h) depositing a metal cathode layer on the electron transport layer; and
- i) forming acoustic wave transducers on the one face of the substrate.

20. A method of manufacturing a touch screen display, comprising the
steps of:

- a) providing a substrate having two opposite faces;
- b) forming a conductive layer on one face of the substrate;
- c) patterning the conductive layer to form metal interconnections for
light emitting elements on the one face of the substrate;
- d) forming a hole injection layer over the metal interconnections;
- e) depositing organic light emitters on the hole injection layer;
- f) depositing an electron transport layer on the organic light emitters;
- g) depositing a semi-transparent or transparent metal cathode layer on
the electron transport layer;

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- h) encapsulating the organic electroluminescent display with a transparent sheet having two faces;
 - i) forming a conductive layer on the face of the transparent sheet external to the organic electroluminescent display;
 - j) patterning the conductive layer to form a lower circuit layer for resistive touch sensitive elements;
 - k) placing a flexible spacer layer having a matrix of spacer dots onto the lower circuit layer;
 - l) attaching a flexible upper circuit layer over the spacer layer; and
 - m) laminating a flexible top protective layer onto the upper circuit layer.

21. A method of manufacturing a touch screen display, comprising the steps of:

a) forming the light emitting elements of an electroluminescent display by:

- i) providing a substrate having two opposite faces;
- ii) forming a conductive layer on one face of the substrate;
- iii) patterning the conductive layer to form metal interconnections for light emitting elements on the one face of the substrate;
- iv) forming a hole injection layer over the metal interconnections;
- v) depositing organic light emitters on the hole injection layer;
- vi) depositing an electron transport layer on the organic light emitters; and
- vii) depositing a semi-transparent or transparent metal cathode layer on the electron transport layer;

- b) forming the touch sensitive elements of a resistive touch screen by:
 - i) providing a transparent sheet with two opposite faces;
 - ii) forming a conductive layer on one face of the transparent sheet;

- iii) patterning the conductive layer to form a lower circuit layer for resistive touch sensitive elements;
- iv) placing a flexible spacer layer having a matrix of spacer dots onto the lower circuit layer;
- v) attaching a flexible upper circuit layer over the spacer layer; and
- vi) laminating a flexible top protective layer onto the upper circuit layer.

c) encapsulating the touch screen display with the transparent sheet, such that the light emitting materials are internal to the touch screen display and the touch sensitive elements are external to the touch screen display.

22. A method of manufacturing a touch screen display, comprising the steps of:

- a) providing a substrate having two opposite faces;
- b) forming a conductive layer on one face of the substrate;
- c) patterning the conductive layer to form metal interconnections for light emitting elements on opposite sides of the substrate;
- d) forming a hole injection layer over the metal interconnections;
- e) depositing organic light emitters on the hole injection layer;
- f) depositing an electron transport layer on the organic light emitters;
- g) depositing a semi-transparent or transparent metal cathode layer on the electron transport layer;
- h) encapsulating the touch screen display with a transparent sheet having two faces;
- i) forming a pattern of transparent metal oxide on the face of the transparent sheet external to the touch screen display for a capacitive sensing touch screen, the pattern having corners; and
- j) placing metal contacts on the corners of the transparent metal oxide layer.

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23. A method of manufacturing a touch screen display, comprising the steps of:

a) forming the light emitting elements of an electroluminescent display by:

i) providing a substrate having two opposite faces;
ii) forming a conductive layer on one face of the substrate;
iii) patterning the conductive layer to form metal interconnections for light emitting elements on opposite sides of the substrate;

iv) forming a hole injection layer over the metal interconnections;
v) depositing organic light emitters on the hole injection layer;
vi) depositing an electron transport layer on the organic light emitters; and

vii) depositing a semi-transparent or transparent metal cathode layer on the electron transport layer;

b) forming the touch sensitive elements of a capacitive sensing touch screen by:

i) providing a transparent sheet having two opposite faces;
ii) forming a pattern of transparent metal oxide on one face of the top transparent material, the pattern having corners; and
iii) placing metal contacts on the corners of the transparent metal oxide layer;

c) encapsulating the touch screen display with the transparent sheet, such that the light emitting materials are internal to the touch screen display and the touch sensitive elements are external to the touch screen display.

24. A method of manufacturing a touch screen display, comprising the steps of:

a) providing a substrate having opposite faces;
b) forming a conductive layer on one face of the substrate;

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c) patterning the conductive layer to form metal interconnections for light emitting elements;

d) forming a hole injection layer over the metal interconnections;

e) depositing organic light emitters on the hole injection layer;

f) depositing an electron transport layer on the organic light emitters;

g) depositing a semi-transparent or transparent metal cathode layer on the electron transport layer;

h) encapsulating the touch screen display with a transparent sheet having two faces;

h) etching a pattern of surface acoustic wave reflectors into the face of the transparent sheet external to the touch screen display; and

i) forming acoustic wave transducers on the one face of the transparent sheet.

25. A method of manufacturing a touch screen display, comprising the steps of:

a) forming the light emitting elements of an electroluminescent display by:

i) providing a substrate having opposite faces;

ii) forming a conductive layer on one face of the substrate;

iii) patterning the conductive layer to form metal interconnections for light emitting elements;

iv) forming a hole injection layer over the metal interconnections;

v) depositing organic light emitters on the hole injection layer;

vi) depositing an electron transport layer on the organic light emitters; and

vii) depositing a semi-transparent or transparent metal cathode layer on the electron transport layer;

b) forming the touch sensitive elements of a surface acoustic wave touch screen by:

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i) etching a pattern of surface acoustic wave reflectors into one face of a transparent sheet; and

ii) forming acoustic wave transducers on the one face of the transparent sheet.

c) encapsulating the touch screen display with the transparent sheet, such that the light emitting materials are internal to the touch screen display and the touch sensitive elements are external to the touch screen display.